

## WHAT DRIVES THE PERFORMANCE OF COMMERCIAL BANKS IN ETHIOPIA?

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### ABSTRACT

*This paper investigates the impact of macroeconomic factors, financial system, banking sector variables and bank-specific characteristics on Ethiopian commercial banks' profits measured using return on assets (ROA) measure of profit during the period of 2001 to 2008. The random effect panel data regression result shows that the capital strength, bank intermediation and size measures have a positive and dominant influence on their profitability. The other significant factors being efficiency in expense management measured by overhead has negative and significant on profit measures. Thus, overhead, capital strength, bank intermediation and size measures are important determinants of bank profits in Ethiopia.*

### KEYWORDS

Banking, Finance, performance.

### INTRODUCTION

Ethiopia's financial sector remains closed and is much less developed than its neighbours. Ethiopia has no capital market and very limited informal investing in shares of private companies. A series of financial sector reforms has been introduced since 1994, when private banks were allowed to be re-established. But the three large state-owned banks continue to dominate the market in terms of capital, deposits and assets. Ethiopian financial system is highly bank dominated. From 2001 to 2008, the banking sector constitutes 95 percent of assets, 96.53 percent of deposits, 94 percent of loans and deposits and 76.78 percent of equity of the financial sector on average.

As banks dominate the financial sector in Ethiopia, ensuring the financial health of them can be considered as an indication of the performance of the financial system of the country. The financial system is an important ingredient in any economic environment of a country. The very function of this particular sector has an immense impact on the economic system. Hence, it is very much essential for a country to look after its financial system continuously. The soundness and safety of the financial system could be done by assessing the performance and determinants of performance and act accordingly to curve the situation to the benefit of the individual institutions, financial system and to the economy at large. In this regard, the study to investigate determinant factors of profit performance of Ethiopian commercial banks.

Considering the nature and objective of the present study, we have used return on assets (ROA) as performance measures of profit performance and external and internal variables as independent variables are used. The effects of the independent variables on the profit measurement variables are analyzed using random effects panel data regression model as it is favored by the Hausman specification test.

The rest of the paper is structured as follows: Section II provides a brief review of the literature of previous research relating to determinants of bank performance. Section III discusses the set of variables used for assessing the determinants of performance of banks. Section IV describes the data and methodology. Section V presents the empirical results, and Section VI concludes.

### LITERATURE REVIEW ON THE DETERMINANTS OF BANK PERFORMANCE

Studies on the determinants of banks' interest margin and profitability have focused whether on a particular country (Kosmidou, Tanna and Pasiouras; Wong et al, (2007); Guru et al., 2002; Barajas et al., 2001; Naceur and Goaid, 2003) and on a panel of countries (Abreu and Mendes, 2002; Demerguc- Kunt and Huizingha, 1999).

The empirical evidence due to; Naceur and Goaid(2001); Guru et al. (2002) ;Wong et al (2007) and Kosmidou, Tanna and Pasiouras and are among the literatures assessed in Single Country Studies category.

Naceur and Goaid(2001) in their paper termed The Determinants of Commercial Bank Interest Margin and Profitability: Evidence from Tunisia have found that individual bank characteristics explain a substantial part of the within-country variation in bank interest margins and net profitability. High net interest margin and profitability tend to be associated with banks that hold a relatively high amount of capital, and with large overheads. Second, the paper finds that the inflation has a positive impact on banks' net interest margin while economic growth has no incidence. Third, turning to financial structure and its impact on banks' interest margin and profitability, concentration is less beneficial to the Tunisian commercial banks than competition. Stock market development has a positive effect on bank profitability. This reflects the complementarities between bank and stock market growth. The disintermediation of the Tunisian financial system is favorable to the banking sector profitability. They investigated the impact of banks' characteristics, financial structure and macroeconomic indicators on banks' net interest margins and profitability in the Tunisian banking industry for the 1980-2000 period using panel data regression.

Guru et al. (2002) attempt to identify the determinants of successful deposit banks in order to provide practical guides for improved profitability performance of these institutions. The study is based on a sample of seventeen Malaysian commercial banks over the 1986-1995 period. The profitability determinants were divided in two main categories, namely the internal determinants (liquidity, capital adequacy and expenses management) and the external determinants (ownership, firm size and external economic conditions). The findings of this study revealed that efficient expenses management was one of the most significant factors in explaining high bank profitability. Among the macro indicators, high interest ratio was associated with low bank profitability and inflation was found to have a positive effect on bank performance.

Wong et al (2007) in their research article titled determinants of the performance of banks in Hong Kong have found that in Hong Kong's case, market structure, such as market concentration and market shares of banks, is not a major contributory factor of a bank's profit and the general level of profitability of a banking market. Cost efficiency of banks, which measures the ability of banks to optimize their input mix for producing outputs, is a major determinant of banks'



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### CONTENTS

Sr. No.	TITLE & NAME OF THE AUTHOR (S)	Page No.
1.	A CROSS-SECTIONAL STUDY OF ACCEPTANCE OF MENTORING FOR PROFESSIONAL DEVELOPMENT IN EDUCATIONAL INSTITUTIONS IN GULF COUNTRIES <i>DR. IMRAN HAMEED &amp; DR. NAZIA RASOOL QAZI</i>	1
2.	ROLE OF USER FEES IN ETHIOPIA: A CASE STUDY OF JIMMA UNIVERSITY SPECIALIZED HOSPITAL, SOUTH WEST ETHIOPIA <i>DR. DEVI NAIR &amp; KORA TUSHUNE</i>	6
3.	EXPORT GROWTH OF NON – OIL SECTOR IN OMAN: THE ERA OF LIBERALIZATION <i>DR. THRESIAMMA VARGHESE</i>	13
4.	CORPORATE SOCIAL RESPONSIBILITY: ORGANIZATIONAL COMMITMENT IN THEORY & PRACTISE <i>DR. QADAR BAKHSH BALOCH, IMRAN ULLANH KHAN &amp; SHAHED JAN</i>	17
5.	CORPORATE GOVERNANCE AND PERFORMANCE OF PAKISTANI LISTED COMPANIES - A CASE STUDY OF SUGAR SECTOR <i>KAISER RAFIQUE YASSER</i>	23
6.	STATE OF FLEXIBLE CAREERS FOR THE WOMAN PROFESSIONAL IN INDIA <i>SAUNDARYA RAJESH</i>	31
7.	WHAT DRIVES THE PERFORMANCE OF COMMERCIAL BANKS IN ETHIOPIA? <i>DR. DEEPAK KAPUR &amp; ABEBAW KASSIE GUALU</i>	38
8.	NEEDS ASSESSMENT OF EMOTIONAL INTELLIGENCE IN BUSINESS EDUCATION <i>KRISHNA PRIYA &amp; DR. K. S. CHANDRASEKAR</i>	43
9.	CREDIT MANAGEMENT OF INDIAN COMMERCIAL VEHICLE INDUSTRY <i>N. VELMATHI &amp; DR. R. GANESAN</i>	48
10.	EVALUATION OF PASSENGER SATISFACTION AND SERVICE QUALITY IN INDIAN RAILWAYS - A CASE STUDY OF SOUTH CENTRAL RAILWAY USING RAILQUAL <i>M. DEVI PRASAD &amp; DR. B. RAJA SHEKHAR</i>	53
11.	A STUDY OF TERTIARY EDUCATION AND SHIFTS IN GLOBALLY MOBILE STUDENTS <i>DR. Y. V. REDDY &amp; D. M. DESHPANDE</i>	58
12.	DIMENSION OF FINANCIAL PERFORMANCE OF CEMENT UNITS IN SOUTH INDIA - AN EMPIRICAL STUDY (Z SCORE ANALYSIS) <i>DR. R. SRINIVASAN &amp; C. U. TIRIPURA SUNDARI</i>	64
13.	AN EMPIRICAL ANALYSIS OF FINANCIAL LEVERAGE, EARNINGS AND DIVIDEND: A CASE STUDY OF MARUTI SUZUKI INDIA LTD. <i>DR. SANJAY J. BHAYANI &amp; DR. BUTALAL AJMERA</i>	69
14.	SERVICES MARKETING DYNAMICS – AN EXAMINATION OF SPORTS SPONSORSHIP STRATEGIES OF U. K. MARKET <i>DR. S. P. RATH, DR. BISWAJIT DAS &amp; CHEF. ANANT BHAMKAR</i>	73
15.	NPA'S SIDE EFFECT AND IT'S CURATIVE MANTRA <i>DR. B. CHANDRA MOHAN PATNAIK, DR. IPSEETA SATPATHY &amp; AROOP KUMAR MOHAPATRA</i>	77
16.	THE ROLE OF EMOTIONAL INTELLIGENCE IN SELF DEVELOPMENT OF DOCTORS AN EMPIRICAL STUDY <i>M. N. R. MANOHAR &amp; A. V. SATYANARAYANA RAO</i>	81
17.	RISK MINIMIZATION IN SPOT AND DERIVATIVE MARKET <i>DR. SUBRATA MUKHERJEE &amp; DR. SAMIR GHOSH</i>	87
18.	IMPORTANCE-PERFORMANCE ANALYSIS (IPA) TO EXPLORE ORGANIZATIONAL CLIMATE – EMPIRICAL EVIDENCE <i>SUBASHINI R &amp; SAMUEL S</i>	93
19.	GOA TOURISM: MYTHS AND REALITIES <i>DR. HIRANMOY ROY</i>	98
20.	SPIRITUALITY AND MANAGEMENT <i>V. NITHYANANTHAN &amp; DR. B. KALPANA</i>	103
21.	ORGANIZATIONAL HEALTH: EXAMINING WORKPLACE PRACTICES AND WELL-BEING <i>DR. R. PRABHAKARA RAYA &amp; P. SIVAPRAGASAM</i>	107
22.	EMPLOYEE SIXTH PAY COMMISSION: ESTIMATION OF JOB SATISFACTION AMONG CENTRAL GOVERNMENT <i>DR. RAJESH KUMAR SHASTRI &amp; MALAVIKA SINHA</i>	111
23.	PRODUCTIVITY CHANGE IN THE INDIAN HEALTH INSURANCE BUSINESS: A MALMQUIST TOTAL FACTOR PRODUCTIVITY ANALYSIS <i>DR. SUMNINDER KAUR BAWA &amp; RUCHITA</i>	115
24.	THE IMPACT OF CAPITAL ADEQUACY REQUIREMENTS ON PROFITABILITY OF PRIVATE BANKS IN INDIA - A CASE STUDY OF J&K, ICICI, HDFC AND YES BANK <i>DR. KHALID ASHRAF CHISHTY</i>	122
25.	AN EMPIRICAL STUDY ON EFFECT OF WELFARE MEASURES ON EMPLOYEES' SATISFACTION IN INDIAN RAILWAYS <i>DR. ASIYA CHAUDHAY &amp; ROOHI IQBAL</i>	130
	REQUEST FOR FEEDBACK	138

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profitability. This paper develops a model to identify the major determinants of a bank's profit, and the general level of profitability of a banking market. The paper employed the Berger-Hannan (1993) approach and a panel dataset of retail banks in Hong Kong covering the period 1991-2005 to examine how banks' performance is determined, by including direct measures of efficiency in the empirical analysis, along with variables representing market structures and other controlling factors. The bank performance is proxied by return on assets.

A research article in 2008 titled The Determinants of Bank Performance in China suggested economic value added and the net interest margin do better than the more conventional measures of profitability, namely return on average equity (ROAE) and return on average assets (ROAA). Some macroeconomic variables and financial ratios are significant with the expected signs. Though the type of bank is influential, bank size is not. Neither the percentage of foreign ownership nor bank listings has a discernable effect. The original sample includes 76 banking institutions based in China between 1999 and 2006. The study has used regression analysis and the dependent variables include return on average equity (ROAE), return on average assets (ROAA), economic value added and net interest margin and the independent variables include bank specific (cost to income, equity to total assets, liquid assets to deposits, loan loss reserves to gross loans, total assets, net loans to total assets, other operating assets to average assets) and macroeconomic (inflation, annual real GDP growth, annual unemployment rate). Kosmidou, Tanna and Pasiouras have found that the capital strength, efficiency in expenses management and bank size of UK banks has a positive and dominant influence on their profitability. Naceur and Goaid (2003) have found that individual bank characteristics explain a substantial part of the within-country variation in bank interest margins and net profitability. High net interest margin and profitability tend to be associated with banks that hold a relatively high amount of capital, and with large overheads. The inflation has a positive impact on banks' net interest margin while economic growth has no incidence. Concentration is less beneficial to the Tunisian commercial banks than competition. Stock market development has a positive effect on bank profitability. The disintermediation of the Tunisian financial system is favorable to the banking sector profitability.

## PERFORMANCE MEASURES AND DETERMINANTS

The primary focus of the following variables is to uncover the impact of performance determinants on profit performance measures in Ethiopia.

### 1. PERFORMANCE MEASURES

In line with earlier studies that examined the determinants of banks' profits or profitability, the study relies on the return on assets (ROA), calculated as net profit after tax divided by average total assets. This is probably the most important measure used in comparing the operating performance of banks, and the average value is used in order to control for differences that occur in assets during the fiscal year. ROA measures the profit earned per dollar of assets and reflects how well bank management use the banks' real investment resources to generate profits.

Table 1 gives a brief description of the variables used to measure the profit performance of Ethiopian banks.

[Insert Table 1]

### 2. INDEPENDENT VARIABLES

#### EXTERNAL DETERMINANTS

Turning to the external determinants, four measures are considered, two of which represent the influence of macroeconomic conditions, one of financial sector development (size of financial system) and one of banking structure (CONC). The rate of GDP per capita growth (GROWTH) and inflation (INF) are the two macroeconomic variables. GROWTH reflects the state of the economic cycle and is expected to have an impact on the demand for banks loans. Inflation affects the real value of costs and revenues although it may have a positive or negative effect on profitability depending on whether it is anticipated or unanticipated (Perry, 1992).

The size of the financial sector is represented by financial assets to gross domestic product (FAGDP) and the structure of the banking industry is represented by concentration (CONC)). FAGDP is expressed as the ratio of financial system assets to GDP of the country, and provides an indication of the size of the financial sector or financial development in the economy which is measured by the ratio of total assets of the financial system to GDP and is intended to measure the importance of bank financing in the economy. It is expected to influence positively bank performance. Since the stock markets are virtually nonexistent in Ethiopia, stock market development is not dealt with.

CONC is calculated by dividing the total assets of the largest bank (CBE) in the market with the total assets of all banks operating in the market. A positive effect of this variable would signify a high degree of concentration since, according to the Structure-Conduct Performance (SCP) hypothesis, banks in highly concentrated markets tend to collude and therefore earn monopoly profits (Short, 1979; Gilbert, 1984; Molyneux et al., 1996). However, not all studies have found evidence to support the SCP hypothesis. From the 45 studies reviewed by Gilbert (1984) only 27 provided evidence that the SCP paradigm holds.

As potential determinants of Ethiopian commercial banks' profits, two measures representing the influence of macroeconomic conditions, two measures of banking and market structure and six bank-specific measures are considered.

#### INTERNAL DETERMINANTS

The six measures used as internal determinants of performance are: the excess of noninterest expense over total noninterest income to net interest income ratio (OH) as an indicator of efficiency in expenses management; ratio of equity to total assets (CA) to represent capital strength; ratio of Nonperforming assets (loans) to total loans and advances (NPL) as an indicator of banks' asset quality; ratio of Banks' loans to total assets (LA); representing bank intermediation, the total assets of a bank representing its size (SIZE) and time to see the changes through time.

The excess of noninterest expense over total noninterest income to net interest income ratio (OVERHEAD, OH) measures the overhead or costs of running the bank, as percentage of net interest income. It is typically used as an indicator of management's ability to control costs. Since higher expenses normally mean lower profits and vice versa. It also measures the burden of non interest earning on interest income. It also is used to provide information on variation in bank costs over the banking system. Overhead is expected to have a negative impact on performance because efficient banks are expected to operate at lower costs. Equity to total assets (CA) measures of capital strength (capital management ability). It is also expected that the higher equity-to-asset ratio, the lower the need to external funding and therefore higher profitability. It also a sign that well capitalized bank face lower costs of ongoing bankrupt and then cost of funding is reduced.

Nonperforming assets (loans) to total loans and advances (NPL) is a measure of bank asset quality. The amount of nonperforming assets has a direct implication in the profitability of the bank, that is if the proportion of the non performing assets in relation to total loans increase the profitability will be decreased and vice versa

Bank loans (LA) are expected to be the main source of income and are expected to have a positive impact on bank performance. Other things constant, the more deposits are transformed into loans, the higher the interest margin and profits. However, if a bank needs to increase risk to have a higher loan-to-asset ratio, then profits may decrease. In addition, as bank loans are the principal source of income, it is expected that non-interest bearing assets impact negatively on profits.

The size of the bank is also included as an independent variable to account for size related economies (scale economies with reduced costs, or scope economies that result in loan and product diversification, thus providing access to markets that a small bank cannot entry) and diseconomies of scale. In most of the finance literature, the total assets and total shareholders' equity of the banks are used as a proxy for bank size. However, since most of the variables in the models were deflated by total assets it would be appropriate to log total assets before including it in the model.

## DATA AND METHODOLOGY

### DATA

Financial data for the commercial banks were obtained from the individual banks financial statements (annual balance sheet and income statements), supplemented by macroeconomic, financial and banking structure from annual reports of National Bank of Ethiopia (the central bank in Ethiopia). All commercial

banks which were operational within Ethiopia in the study period are included. The time period of the study is from 2001 to 2008. The fiscal year ends on July 7 of each year. This yielded a balanced panel data for 8 commercial banks, consisting of 62 observations.

Table 2 shows the results of multicollinearity diagnostics using variable inflation factor (VIF) the VIF value of concentration is 19.25 and concentration is dropped as the value of its VIF is greater than 10. As a rule of thumb, if the VIF of a variable exceeds 10, that variable is said to be highly collinear (Gujrati and Sangeetha, 2008). (Insert Table 2 here). And in order to study the impact of concentration on the performance of banks, the random effects regression including concentration but excluding the variable that had higher correlation with concentration has been used. Inflation had the highest inflation with concentration variables partial regressions have been used to identify correlations among the independent. (Insert Table 5 here).

#### METHODOLOGY

Random and fixed effects panel data regression equations are used to examine the determinants of the profits or profit performance of Ethiopian commercial banks. Performance is examined as a function of bank specific factors, macro economic factors and financial sector factors.

$$Y_{it} = (\alpha_i + u_i) + \beta_i X_{it}$$

Where;  $Y_{it}$  is the performance of a given bank at a specified time measured in terms of ROA; where  $i$ =banks and  $t$ = time

$(\alpha_i + u_i)$  is the error term

$\beta_i$  is the coefficient for that independent variables

$X_{it}$  represents a vector of independent variables for each bank ( $i$ ) and at time ( $j$ ).

Independent variables consist of Macroeconomic factors, financial structure factors and bank specific factors. Macro economic factors include GDP per capita growth rate and inflation; financial sector factors include total financial assets of in the economy to GDP and Bank concentration; Bank characteristics indicators include profitability, efficiency, capital management, asset quality, intermediation and size measures.

The preference for a random effects model over a fixed effects model was based on the use of the Hausman test (Baltagi, 2001). Thus, The Hausman specification test is used to discriminate between the fixed and random effects in the panel data. The Hausman specification test shows that there is no significant differences in the coefficients estimated using fixed and random effects regression ( $\chi^2(5) = 6.87$ , Prob >  $\chi^2 = 0.23$ ). Thus random effect regression is favored.

Test for random effects: it is made using Breusch and Pagan Lagrangian multiplier test for random effects:  $\chi^2(1) = 2.17$ , Prob >  $\chi^2 = 0.1407$ . Thus the data is fit for the random effects regression.

Autocorrelation and heteroscedasticity is controlled by using robust clustered standard errors in the random effects model.

The normality of the error term is checked by Shapiro-Wilk test for normal data and is found normal, as  $p$  value is greater than 0.05. (See Table 4)

#### RESULTS

Since random effect regression is favored for the panel data regression using ROA as profit performance measure, the interpretation is made using random effects model.

#### INTERPRETATION

The dependent variable ROA was modeled as a function of a number of explanatory variables. The dataset contains 62 "observations", which is 8 banks each observed, on average, on 7.8 different years. An observation in the data is a bank in a given year. The data contains variable  $i$  identifying the banks; the  $i$  index in  $x[i, t]$ .

A model test for random effect regression is checked by the wald test (Wald  $\chi^2(6) = 6097.87$ , Prob >  $\chi^2 = 0.0000$ ). The null hypothesis is all coefficients of regressors in the model have a value of zero. As it is less than .05, the model is fit for our purpose showing the ability of explanatory variables to determine the dependent variable. The differences across units are uncorrelated with the regressors' (Corr( $u_i$ ,  $X = 0$  (assumed))).

Coefficients of explanatory variables show that the average effects of explanatory variables over ROA when explanatory variables changes across time and between banks by one unit.

Z values test the hypothesis that each coefficient is different from 0. To reject it should be greater than 1.96 for 95 percent confidence level or  $P$  values should be less than .05 to reject the hypothesis. Thus, OH, CA, LA and LOGA values greater than 1.96 Z values (less than or equal to 0.05  $P$  values), that is the coefficient values are different from zero, that is, they are determinants of ROA.

#### EXTERNAL FACTORS

When we look the effects of external factors on banking performance measured in terms of ROA, all of them were not significant. Economic growth could have a positive, negative and no effect on the financial sector performance. GROWTH has no significant effect on the profitability of Ethiopian banks.

The other macroeconomic indicator variable inflation (INF) has a positive association between inflation and bank profitability considering the findings of previous studies (e.g. Claessens et al., 1998; Demircuc-Kunt and Huizinga, 1999). The positive association is related to the theory that inflation was anticipated giving banks the opportunity to adjust interest rates accordingly, resulting in revenues that increased faster than costs, thus implying higher profits. But, inflation has no significant effect on the profitability of Ethiopian banks. One reason for this could be the interest rate spread is not responding with the economic condition of the country, and the positive association of inflation and profitability could be due to non interest related activities.

TAGDP and CONC have no any significant effect on the profitability of Ethiopian banks. This implies that the effect of financial sector development and completion among the banking sector have no significant impact on the profitability of Ethiopian banks.

#### INTERNAL FACTORS

As expected the coefficient of the noninterest expense over noninterest income to net interest income ratio (OH) is negative on Ethiopian bank profits. This ratio has a negative effect and significant on ROA. Thus, it suggests that efficiency in expenses management is a determinant of Ethiopian bank profits. Guru et al. (1999), Kosmidou (2006) and Pasiouras et al. (2006) also confirm this inverse relationship for Malaysia, Greece and Australia respectively.

Capital strength makes a significant contribution to the profitability of the Ethiopian banks, as the relatively high coefficient of the equity to assets ratio (EQAS) shows. The ratio is positive and significant. This finding is consistent with previous studies (Berger, 1995; Demircuc-Kunt and Huizinga, 1999; Ben Nacuer, 2003; Kosmidou, 2006; Pasiouras et al., 2006) and indicates that well capitalized banks face lower costs of going bankrupt, which suggests reduced cost of funding or lower need for external funding, implying higher profits.

As expected the coefficient of nonperforming loans and advances to the total loans and advances ratio (NPL) is negative on Ethiopian bank profits but not significant at  $P$  is greater than 0.05 but it was significant at 10 percent level as the  $P$  value is less than 0.1.

Next, it is found a direct relationship between intermediation and profitability. When the effect of intermediation is considered, as expected the coefficient of total loans and advances to total assets ratio (LA) is positive and significant on Ethiopian bank profits. Thus, it suggests that efficiency in intermediation activities is a determinant factor of Ethiopian bank profits. At last, it is also found a direct and significant relationship between bank size and profitability. This implies that large banks have the greater potential to earn more profits in Ethiopia.

#### CONCLUSIONS

This study investigates the impact of bank-specific characteristics, macroeconomic conditions and financial market structure on Ethiopian owned commercial banks' profits, measured by return on average assets (ROA). A balanced panel data set of 62 observations, covering the period 2001-2008, provided the basis for the econometric analysis.

The results show that capital strength, represented by the equity to assets ratio, bank intermediation ratio represented by banks loans to total assets and bank size represented by assets, are the main determinants of Ethiopian banks profits. This provides support to the argument that well capitalized banks face lower



costs of external financing, which reduces their costs and enhances profits. Studies for other countries also support this finding (Berger, 1995; Demircuc-Kunt and Huizinga, 1999; Ben Nacuer, 2003; Pasiouras and Kosmidou, 2006; Pasiouras et al. 2006). Size measures have a positive effect on profitability supporting the economies of scale argument. The impact of overhead to net interest income and nonperforming loan ratios are negative and significant.

When we assess the external factors, they have a relatively small impact on the profitability of Ethiopian banks. None of these measures were significant. Thus, overhead, capital strength and bank intermediation and size measures are important determinants of bank profits in Ethiopia. This shows that the key for success in profit for banks rely on individual bank characteristics implying proper management of activities by individual banks is indispensable to be profitable.

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## TABLES

TABLE 1- VARIABLES DESCRIPTION

### DEPENDENT

1. ROA: The return on average total assets of Ethiopian Commercial banks (Net income after taxes to average assets).

### INDEPENDENT

Macroeconomic and Financial Structure (External Factors)

Macroeconomic factors

1. RGPCG (Growth): Economic growth proxied by real GDP per capita growth rate.
2. INF The annual inflation rate

Financial Structure factors

1. FAGDP (Total financial assets to GDP): This variable serves as a proxy of financial development.
2. CONC: The C1 concentration measure calculated by dividing the assets of the one largest bank (The Commercial Bank of Ethiopia) with the assets of all banks operating in the market. This variable serves as the proxy of competition in the banking sector.

Banks characteristics or bank specific variables (Internals Factors)

1. OH: This is the excess of noninterest expense over total noninterest income to net interest income ratio. It provides information on the efficiency of the management regarding expenses relative to the revenues it generates. Higher ratio implies less efficient management.
2. CAP: This is a measure of capital strength (management), calculated as equity to total assets. High ratio implies low leverage and therefore lower risk.
3. NPL: It shows the extent of nonperforming loans and advances out of the total loans and advances provided by banks. It is measured by Nonperforming assets (loans) to total loans and advances; proxy for bank Asset quality and risk. The higher the ratio the poorer the quality and therefore the higher the risk of the loan portfolio.
4. LA it is Bank's loans to total assets (BLOAN); proxy for intermediation. Other things constant, the more deposits are transformed into loans, the higher the interest margin and profits and
5. LOGA (Size): Bank total assets; proxy for size measures.

A Table that provides a description of all the variables considered in this study, indicating also their likely association with bank performance.

TABLE 2: MULTICOLLINEARITY DIAGNOSTICS: VIF AND 1/VIF VALUES OF INDEPENDENT VARIABLES

Variable	VIF	1/VIF
conc	19.25	0.051950
inf	5.58	0.179058
loga	4.51	0.221776
npl	3.29	0.304233
la	3.15	0.316961
fagdp	2.93	0.341643
rgpcg	2.86	0.349212
ca	2.82	0.355155
oh	1.91	0.522633
Mean VIF	5.14	

TABLE 3: RESULTS OF RANDOM EFFECTS WITH ROBUST- CLUSTERED STANDARD ERRORS TAKING ROA AS PERFORMANCE MEASURE OF BANKS

Independent Variables	Dependent Variable ROA	
	Coef.	P > z
RGPCG	-0.011	0.326
INF	-0.012	0.57
TAGDP	-0.004	0.578
CONC	-0.027	0.621
OH	-0.031	0
CA	0.072	0.035
NPL	-0.039	0.08
LA	0.051	0
LOGA	0.636	0.027
_CONS	-2.644	0.235
Number of observations	62	
Model Fitness test	Wald chi2(6) = 6097.87 Prob > Chi2 = 0.000	
Breusch and Pagan Lagrangian multiplier test	chi2(1) = 2.17, Prob > chi2 = 0.14	
Rho	0	
The Hausman test	Chi2 (5) = 6.87, Prob>chi2 = 0.231	
Corr(U_i,Xb)	0	

Notes: 8 Banks, period 2001-2008, No. of observations = 64; observations in each group or bank is : min = 7, Avg = 7.8 and Max = 8, significance values of p at the 5 % level.

TABLE 4: NORMALITY TEST OF THE ERROR TERM

Shapiro-Wilk test for normal data

variable	Obs	z	Prob>Z
U_it	62	0.349	0.363

obs=64)

TABLE 5: PARTIAL CORRELATION OF CONC WITH

Variable	Corr.	Sig.
rgpcg	-0.6644	0.000
inf	-0.7050	0.000
fagdp	0.5106	0.000
oh	0.0386	0.775
ca	-0.1090	0.420
npl	0.2392	0.073
la	-0.3764	0.004
loga	0.5783	0.000

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